

**INTERNET-BASED DISPATCHING SYSTEM**

**REFERENCE TO EARLIER APPLICATION**

This Application claims the benefit of United States Provisional Application No.

5 60/150,001, filed August 20, 1999, by Charles E. Bernasconi and Shannon Wainright, entitled  
*Provisional Patent Application.*

**FIELD OF THE INVENTION**

The present invention relates generally to an electronic online ASP database system. More specifically it relates to a secure Internet-based database Application Service Provider (ASP) system and method that receives absence/job order information and automatically (24/7) dispatches substitute and/or temporary employees to job sites for school districts and employment agencies.

**BACKGROUND OF THE INVENTION**

Temporary placement of skilled workers due to planned and unplanned absences or temporary work overloads is critical to our specialized economy. The inherent problem is the tight job market and efficient and accurate placement of those temporary personnel. Absences from work cost employers in lost productivity and sick leave pay. Although temporary workers cannot immediately replace trained professionals, they can provide relief for school, office, or other professions that require a person/s with specific skills or expertise.

In the example of public school districts there is a national shortage of qualified substitute

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teachers to replace absent teachers/employees. This creates a daily problem for districts and individual schools as they often have to “compete” with neighboring districts, often drawing from a narrow “pool” of common substitutes.

Absences are often unpredictable and may occur any time 7 days a week and 24 hours a day (24/7). It is estimated that in any one day, 5% to 10% of teachers may be absent in the United States. Those school districts which efficiently process absence information and substitute notification/dispatch of job openings, will in most cases place substitutes first therefore providing their students with the best available and qualified instructors. School districts however, are often financially limited in their ability to either purchase expensive automated equipment and software or hire additional dispatchers to work off-hours in order to process absence information on a 24/7 basis.

Several companies have attempted to solve these and other problems using automated telephone calling systems. For example the two largest, TSSI, Inc. (tssint.com) and CRS, Inc. (crs-ivr.com) have developed Interactive Voice Response (IVR) telephone calling systems designed to automate the reporting of absences and dispatching of substitutes using touch tone phones. While these systems are designed to work 24/7 without constant administrative personnel (district dispatchers), unlike the present invention, they do require significant capitalization funds. District owned systems require several thousands of dollars to install on-site, local computers, backup power systems, dedicated phone lines (1 to an average a maximum of 8), maintenance equipment, and specialized voice cards that convert data into speech. IVR systems are also limited in transacting absence information by the number of phone lines available, i.e. 4 for an average district’s budget. Unlike the present invention, processing transactions becomes especially acute in

the mornings. Because of the short window of time before classes start each day, the limited number of phone lines increase busy signals and time delays.

Also unlike the present invention, phone (IVR) calling systems must automatically contact just one substitute at a time going through a generated list of substitutes. IVR systems may often  
5 take hours to finally contact a substitute that will accept the position.

Some IVR systems also require school sites to phone in to the system to receive summaries of who is absent that day and who to expect as a substitute. Faxes from the district office are often delayed and thus are not in "real time." Neither are e-mail summary reports also from the district offices.

Another problem with automated IVR systems is the giving and receiving of specific  
10 instructions regarding the absence day/s (lesson plans). IVR systems only allow the substitute to hear a short, 1 to 2 minute voice message, left by the absent employee. Unlike the present invention, the information and directions often have to be written down by the substitute.

Most IVR systems also require users to contact the district office personnel during regular  
15 office hours to change personal information such as work availability or unavailability, contact information, job title preferences and job areas and locations willing to work.

Another large expense item for school districts using automated IVR systems is the on-site training of substitutes and employees on how best to use the IVR system. Unlike our present invention, this often requires district paid meetings and comprehensive directions manuals.

20 Recently another company, Frontline Data, Inc. (aesoponline.com) has developed a system that includes a combination of IVR, Web based and "toll-free" phone calls. Unlike the present invention where all contacts to the system are via local phone company data connections,

employees report absences and substitutes are contacted with the toll charges made indirectly to the school district.

In the highly competitive private sector, temporary employment agencies process temporary and "temp to hire" job orders from client companies including but not limited to the medical, legal, accounting and technical fields. Agencies must match, notify and place the appropriate temporary agency personnel into job positions. Those that are the most efficient in distributing job order information and placing their appropriate temporary personnel, will be the most successful. Previously, software companies have developed database systems to match and place temporary employees. Different from the present invention, these PC based software programs use telephone contact from the agency office/s and require agency staff employees during regular business hours. While employment agencies have for years used the Internet successfully to recruit "new hires" from the general public, this present invention is designed to actually place recruited pre-approved (tested and qualified) temporary and "temp-to-hire" agency personnel into matching skilled positions responding to job orders from client companies.

There is definitely a need for an expedited system to process absence/job information, update employee profiles 24/7 and contact/place qualified substitute teachers or temporary personnel.

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## SUMMARY OF THE INVENTION

Accordingly, with the increasing accessibility of the Internet and the World Wide Web, it is now possible for selected programmed information to be distributed immediately and automatically to all personnel in an organization (public/private) with Internet access and a “need to know.” That information may be protected and delimited by utilizing logon (password) codes and pre-programmed levels of data access. One example of such an application is Substitute Online™ by Computer Software Innovations, Inc., the assignee of the present invention.

The present invention provides a database and executable code software system and method for school districts and employment agencies. It is designed to dispatch substitute and/or temporary employees utilizing an Application Service Provider “ASP.” This system and method expedites information (via an automated process) through the Internet, the ASP, and various web browsers, i.e. Microsoft’s Internet Explorer or Netscape’s Navigator, including various browser devices, both wired and wireless. The database may be any type of web based data repository. The present invention utilizes but is not limited to Microsoft’s SQL Server 7.

A secure (unique pass word) logon code and a hyper-link from the school district or agency home page, allows the user access to their record information. The database is customized for each school district or temporary agency.

There are three levels of security logon. The amount and the type of information dispersed to each user is determined by their level of security. Substitute teachers or temporary employees

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are at a Level 0 of security. They have access 24/7 to jobs that match their qualifications and may also view and update their own personal profile. Substitutes or temporary workers may change their individual contact information, daily/weekly availability status, working preferences and review and print to hardcopy, personal summaries of prior and future assignments.

Individual teachers/employees are also at Level 0. They may report absence information including days, shifts, reasons, charge codes to the district and request or deny (reject) particular substitutes the assignment. Potential employers of temporary employees have similar capabilities in the requesting or refusing of particular temp employees. Rejected substitutes/temporary employees do not see information regarding job openings where they have been rejected.

When an absent employee or client company requests one or more specific substitute/temporary employees, the system immediately notifies these substitutes/temporary employees via e-mail, e-pager and/or other browser devices that they have been requested. A certain time period, set by the school district/agency, allows the requested person/s to respond.

(This notification of possible substitutes and temporary employees will be explained in depth later.) At the expiration of that time period, the job is then opened for other qualified substitutes or temporaries to select. Once a particular assignment has been filled, it is removed from the open jobs list.

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Administrative personnel have a Level 1 security access for/at their individual school site. Information is also available from any Internet access point including home, library, etc. Open positions, filled absences, assigned substitutes, time of job acceptance and reasons for teacher absence may be viewed. Specific skill preferences and other information regarding substitutes is available. School sites may generate a rejection list of substitutes that will not be assigned to any position at their site. Administrators also have reports in "real time" including individual summaries of absent teachers who have patterns of personal absence or "illness" prior to weekends, holidays, etc.

School secretaries have the option of entering absences on behalf of the absent teacher. Schools may enter en mass, absences for "district initiated" workshops, seminars and other school business with the appropriate budget charge codes. School personnel may fill job openings on-site with their client computer. An example situation might be a "holdover," where a current substitute is asked to work another open position for the following day at that same site but for a different teacher. The school secretary completes the dispatch assignment immediately at their browser device, i.e. PC. School secretaries with Level 1 access cannot view information about other schools or other school absent employees. Status reports are available on-site in real time but only for employees at their site. Level 2 security is granted to staff employees on the district level of a school system. Personnel with level 2 access may view the profiles of all teachers, add/edit/delete records of substitutes including personal information (social security numbers), and change pass

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codes. Staff employees at this level may enter absences on behalf of teachers, request particular substitutes, generate absence reports, and document reasons and duration of absences at any school or for any employee. District staff may also "over-ride" the system and generate lists of available substitutes to call for jobs that require the "personal touch." In the example of temporary employment agencies, Level 1 would be a client company and Level 2 would be represented by the internal dispatching staff of the agency.

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Unlike the present invention, IVR systems are limited to contacting personnel in a specific parameter (number) of phone lines, further separated as either incoming and outgoing lines. The present invention provides immediate job opening information to all qualified and available temp and substitute employees. Also with the present invention, school districts and employment agencies are provided with a productivity advantage in competing for a limited pool of substitutes and temps each day. The neighboring districts or competitor agencies that use IVR or other "manual" or local computer systems are incapable of immediate distribution of absence information to all personnel. The present invention uses the "distributed technology" of the Internet to immediately make that absence and other information available to all appropriate personnel. While phone (IVR) calling systems automatically contact one substitute or temp at a time, going through a list of personnel, they often take hours to finally contact a person that will accept the position. With this invention, our system immediately distributes absence information to all (not rejected) qualified personnel, virtually eliminating the waste of time caused by busy



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signals.

Through their Internet browser device, substitutes/temps are able to see 24/7, all job openings that match their certification/skills and choose the job/s they want to work. They may also update their availability to work on a scheduled basis and other personal information including contact and job/location preferences.

The present invention works as an automated Application Service Provider "ASP" through the Internet. The present invention eliminates large capitalization costs to districts and agencies for hardware setup, installation and support. Also eliminated are overtime costs to hire additional staffing dispatchers to work off-hours in order to manually process absence information and availability on a 24/7 basis.

This invention also provides schools/job work sites up-to-the-second information to be viewed on screen and/or printed out to hardcopy on-site. IVR systems only provide a voice message in real time and faxes/e-mail reports that are delayed in transmission, compared to the present invention.

With the present invention, substitutes and temp employees are also provided, through their Internet browser device, with hardcopy (printed) instructions regarding the absence day/s (lesson plans) or job order (driving directions, dress codes, special equipment/tools, etc.). Lesson plans/info may be printed out with just one key and updated at any time.

The current invention also provides online training of substitutes and employees on how

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5 best to use the Internet based system. Included are on-screen "Help" links at each step and a demo/tutorial hyper-linked to the ASP server. Users receive directions and a step-by-step "slide show" of how the system works. They may use the "Help" functions only as needed and do the training and practice at their convenience, home or elsewhere, thus saving large group training expenses.

As mentioned previously, the present invention provides a system that requires little or no capitalization costs by the school district or agency. The invention is designed to work as an ASP and therefore utilizes a small user fee (currently less than \$1.00) per absence/day transaction versus the capitalization costs of IVR systems. It is therefore possible for even the smallest school district or employment agency to be able to afford a 24/7 automated dispatching system.

10 Compared to IVR systems that require many instructional step-by-step voice prompts and touch tone phone key responses, the present invention is designed for employees to report an absence and substitutes/temps to search and submit a request for an assignment in approximately 3 clicks of their mouse. Because all information is displayed automatically on their browser screen  
15 and the system knows who the user is at logon, default settings are immediately and automatically displayed. Lesson plans and instructions may also be transferred from other word processors, i.e. Microsoft Word. Information may be printed out to hard copy with one key.

#### BRIEF DESCRIPTION OF THE DRAWING

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Figure 1 is a flow chart of how the information passes through the database in a school system example.

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## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

### Glossary of Terms and Acronyms

Application Service Provider (ASP). A third-party entity that manages and distributes software-based services and solutions to customers across a wide area network (Internet and World Wide

Web) from a central data center (Web server).

Client-Server. A model of interaction in a distributed system in which a program at a site sends a request to a program at another site and waits for a response. The requesting program is called the "client" and the program which responds to the request, is called the "server." In the context of the World Wide Web (discussed below), the client is a "Web browser" (or simply "browser") which runs on a computer of a user. The program which responds to browser requests by serving Web pages is commonly referred to as a "Web server".

Distributed Technology. The electronic processing of filtered information from the Web server database to all programmed client browsers through a wide area network (Internet).

Hyperlink. A navigational link from one document to another, or from one portion (or component) of a document to another. Typically, a hyperlink is displayed as a highlighted word or phrase that can be selected by clicking on it using a mouse to jump to the associated document or documented portion.

Hypertext System. A computer-based informational system in which documents (and possibly other types of data entities) are linked together via hyperlinks to form a user-navigable "web".

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Internet. A collection of interconnected (public and/or private) networks that are linked together by a set of standard protocols (such as TCP/IP and HTTP) to form a global, distributed network. (While this term is intended to refer to what is now commonly known as the Internet, it is also intended to encompass variations which may be made in the future, including changes and additions to existing standard protocols).

5 World Wide Web ("Web"). Used herein to refer generally to both (i) a distributed collection of interlinked, user-viewable hypertext documents (commonly referred to as Web documents or Web pages) that are accessible via the Internet, and (ii) the client and sever software components which provide user access to such documents using standardized Internet protocols. Currently, the primary standard protocol for allowing applications to locate and acquire Web documents is HTTP, and the web pages are encoded using HTML. However, the terms "Web" and "World Wide Web" are intended to encompass future markup languages and transport protocols which may be used in place of (or in addition to) HTML and HTTP.

10 HTML (HyperText Markup Language). A standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents. (HTML 15 2.0 is currently the primary standard used for generating Web documents.) During a document authoring stage, the HTML codes (referred to as "tags") are embedded within the informational content of the document. When the Web document (or HTML document) is subsequently transferred from a Web server to a browser, the codes are interpreted by the browser and used to

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parse and display the document. Additionally in specifying how the Web browser is to display the document, HTML tags can be used to create links to other Web documents (commonly referred to as “hyperlinks”). For more information on HTML, see Ian S. Graham, the HTML Source Book, John Wiley and Sons, Inc., 1995 (ISBN 0471-11894-4).

5 HTTP (HyperText Transport Protocol). The standard World Wide Web client-server protocol used for the exchange of information (such as HTML documents, and client requests for such documents) between a browser and a Web server. HTTP includes a number of different types of messages which can be sent from the client to the server to request different types of server actions. For example, a “GET” message, which has the format GET, causes the server to return the document or file located at the specified URL.

10 Turning to Figure 1, we see a flow chart of information transfer through the online ASP database system. The explanation in Figure 1 is for the substitute and regular teacher database embodiment. The other embodiment, temporary employment agencies, has been discussed previously and is very similar in process.

15 The substitute teacher 10 and the absent teacher 50 are representative of Level 0 security access. At 10 and 50, respectively, the substitute teacher and the absent teacher have remote “client” logon to the online ASP database “server” system 100. Substitute teacher 10 and absent teacher 50 logon to the online ASP database server system 100 through any computer with Internet access and a conventional web browser. They may hyperlink from their school district

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home web page as well as use links to "Help" screens and a demo/tutorial (*subdemo.com*) while in the program.

5 There are four options represented at points 60,70,80, and 90 available to the absent teacher 50 once successful logon to the online ASP database system 100 is complete. The option to enter a new absence is represented at 60. At point 60, the absent teacher's 50 screen defaults to the "New Absence" option. The reporting of an absence may be accomplished with as few as 3 clicks of the mouse. When the option New Absence is first entered, the system defaults to the following: 1) a one day absence of "today's date" (the next day's date if entered after 12 noon), 2) an all day shift and 3) for a personal illness reason. If that information is correct, the absent teacher simply clicks on the Submit Absence command button and the absence information is confirmed and then distributed immediately to all available and qualified substitutes. If the absence is not standard, the user may enter another date, other approved reason (including district business), am or pm shift and/or add more continuous days. That information is entered here (point 60) before being submitted for placement on the web server. Also at point 60, the absent teacher 50 may verify previously requested and/or rejected substitutes.

15 At point 70 the absent teacher 50 may optionally enter a lesson plan or written instructions for the substitute. The plan or other instructions may be keyed in or the absent teacher may use the "cut and paste" option from a word processor, if the absence is pre-planned.

At point 80 the absent teacher 50 may review and/or cancel one or more days/shifts of the





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the assignment. The system immediately returns a confirmation number to the substitute and removes the job from the available jobs list. If another substitute has already selected that job, a notice is returned with directions for the substitute to select another open position.

Option 30 gives the substitute teacher 10 a place to edit their user profile and parameters including days of the week that they are not available to work. This is similar to option 90 for absent teachers 50.

Option 40 allows the substitute teacher to review previously worked assignments in order to reconcile their pay check. The substitute may print out a report including details of future assignments. If a substitute has accepted an assignment and then is not able to complete that assignment, it may be cancelled by the substitute and returned to the server for another substitute to accept.

Moving now to the online ASP database system 100, we are introduced to components 110,120,130, 140, and 150. Component 110 is the Internet component of the online ASP database system 100. Internet component 110 synchronizes the online ASP database system 100 with the World Wide Web and allows access to the system by authorized users at logon. The Internet component 110 also provides a conventional software "firewall" system, for security of sensitive data, stored for school systems and temporary employment companies. Component 120 is part of the online ASP database system 100. It 120 holds the profiles of absent teachers 50, substitute teachers 10, school district dispatcher/s 250, and personnel at various school sites or

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work locations 260. The database component 120 is located on the remote server so that individual user school and district systems 260, 250 do not have to hold large amounts of data on their client computers. The database system has filters to send the correct data to the particular school 260, substitute teacher 10, absent teacher 50, or school district dispatcher 250. In this filter component of the database system 120, the online ASP database system 100 is customized to each user's security level or input preferences. In this manner, security is further heightened in that each school site 260 cannot see data concerning other sites.

Dispatching 130 automatically receives new absence information 60, filters rejected substitutes, and immediately distributes the absence information to each qualified substitute client web site. The system also filters client requests for job openings, validates substitute qualifications and availability (conflicts with other assignments), assigns the position to the first submitting substitute and returns a confirmation number for future audit.

A part of the online ASP database system 100 is the requested substitute notification system 140. The notification system 140 locates the requested substitute contact information 30 for the job (e-mail address/e-pager) and processes that information. Each job opening that has specified requested substitute/s, is reserved for only those requested substitutes until 6:00 pm the evening before the job begins.

Another part of the online ASP database system 100 is the reporting system and payroll interface 150. The reporting system 150 accesses the database component 120 and 130 to

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generate personnel reports and payroll/transaction reports upon request from the individual schools 260 or school district 250. The reporting system 150 can manipulate the data to generate number and length of absences for particular employees, substitutes, schools, and specific charge codes for district departments. For each payroll period, absence data is verified at each site 260 and then transferred to the system 100/150 to generate a flat file interface that is manipulated by the district. The file reflects regular and overtime pay rates, incentive pay and budget codes to be charged to the district. When verified as correct by the district payroll office, the data is electronically transferred to the school district payroll system.

At the dispatcher position 250, we see that en route to the online ASP database system 100 the dispatcher has seven possible options. 1) manual dispatch of open jobs 180 that no substitute has accepted, 2) modification of open and selected jobs 190, 3) holding open jobs and releasing only when determined to be appropriate 200, 4) canceling and deleting jobs 210, 5) editing, adding and/or deleting absent teachers/substitute teachers 220, 6) modification of district parameters 230, i.e. reasons for absence, workshops and other district release days including budget and authorization codes, and 7) modification of user parameters 240, i.e. defined holidays and valid non-working dates. Option 180 allows the dispatcher 250 to dispatch jobs that have not been assigned via the automated system. These jobs often require the "personal touch" because they are very specific or no one available wants to work that particular job. The system generates a list of available substitutes including job skills and phone numbers in order to contact a selected

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substitute. Option 190 allows the dispatcher 250 to sort and filter the list of available substitutes by last name, seniority, least times worked and specific skills, i.e. math. The dispatcher 250 can use option 200 to manually hold open jobs for a particular requested substitute teacher 10. Again, the job will be held for the requested substitute until 6 pm the evening before the assignment begins. At option 210 the dispatcher 250 can cancel and delete job openings. Option 210 also allows for the effective use of the online ASP database system 100, in that jobs that are not valid may be easily removed in a timely manner. Option 220 allows dispatcher 250 to edit, add and/or delete permanent teachers 50 and/or substitute teachers 10. In cases of termination of employment, or the hiring of new substitutes or permanent employees, the dispatcher 250 enters the information into the online ASP database system 100 through option 220. The original data is electronically downloaded by the ASP system.

Moving to point 260 we see the connection of the on-site personnel at the school. On-site personnel have Level 1 access, allowing them to process absence information similar to the district dispatcher 250 but only for employees at their school site. Each school secretary may enter and dispatch absences on behalf of absent teachers and select jobs for substitutes at their particular school. Currently, some teachers and substitutes do not have Internet access at home.

Another option at 260 is custom reporting and payroll validation interface (verification that substitutes actually reported for work). On-site personnel 260 can use the custom reporting option 160 to generate reports of absences by individual teachers 50, or reports of all teacher

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absences at their school. In the payroll interface option 170 the school secretary/administrator may upload verified payroll "time sheets" to the ASP database for transfer to the school district payroll system.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following  
5 claims.

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